

**WHAT IS CLAIMED IS:**

- 1           1.       An alkaline battery comprising:  
2           a cathode comprising an additive, the additive including a barium salt and an  
3 electrically conductive material, and a manganese dioxide;  
4           an anode comprising zinc;  
5           a separator between the cathode and the anode; and  
6           an alkaline electrolyte in contact with the cathode and the anode.
- 1           2.       The battery of claim 1, wherein the electrically conductive material is coated  
2 on a surface of the barium salt.
- 1           3.       The battery of claim 1, wherein the electrically conductive material includes a  
2 metal oxide.
- 1           4.       The battery of claim 2, wherein the electrically conductive material includes a  
2 metal oxide.
- 1           5.       The battery of claim 3, wherein the metal oxide is a tin oxide.
- 1           6.       The battery of claim 4, wherein the metal oxide is a tin oxide.
- 1           7.       The battery of claim 1, wherein the barium salt includes barium sulfate,  
2 barium hydroxide, barium carbonate, or barium oxide.
- 1           8.       The battery of claim 1, wherein the manganese dioxide is an electrolytic  
2 manganese dioxide.
- 1           9.       The battery of claim 1, wherein the service life of the battery in an intermittent  
2 discharge test is at least 2% longer than the service life of a battery lacking the particle.
- 1           10.      The battery of claim 1, wherein the service life of the battery in an intermittent  
2 discharge test is at least 3% longer than the service life of a battery lacking the particle.
- 1           11.      An alkaline battery comprising:  
2           a cathode comprising an additive, the additive including a barium salt and a coating

3 on a surface of the barium salt, and a manganese dioxide;  
4 an anode comprising zinc;  
5 a separator between the cathode and the anode; and  
6 an alkaline electrolyte in contact with the cathode and the anode.

1 12. The battery of claim 11, wherein the coating is electrically conductive.

1 13. The battery of claim 12, wherein the coating includes a metal oxide.

1 14. The battery of claim 13, wherein the metal oxide is a tin oxide.

1 15. The battery of claim 11, wherein the barium salt includes barium sulfate,  
2 barium hydroxide, barium carbonate, or barium oxide.

1 16. The battery of claim 11, wherein the manganese dioxide is an electrolytic  
2 manganese dioxide.

1 17. The battery of claim 11, wherein the service life of the battery in an  
2 intermittent discharge test is at least 2% longer than the service life of a battery lacking the  
3 particle.

1 18. The battery of claim 11, wherein the service life of the battery in an  
2 intermittent discharge test is at least 3% longer than the service life of a battery lacking the  
3 particle.

1 19. A method of manufacturing an alkaline battery comprising forming a cathode  
2 including a cathode active material including a manganese dioxide, and an additive including  
3 a barium salt and an electrically conductive material.

1 20. The method of claim 19, wherein the electrically conductive material is coated  
2 on a surface of the barium salt.

1 21. The method of claim 19, wherein the electrically conductive material includes  
2 a metal oxide.

1           22.     The method of claim 20, wherein the electrically conductive material includes  
2     a metal oxide.

1           23.     The method of claim 21, wherein the metal oxide is a tin oxide.

1           24.     The method of claim 22, wherein the metal oxide is a tin oxide.

1           25.     The method of claim 19, wherein the barium salt includes barium sulfate,  
2     barium hydroxide, barium carbonate, or barium oxide.

1           26.     The method of claim 19, wherein the manganese dioxide is an electrolytic  
2     manganese dioxide.

1           27.     The method of claim 19, further comprising assembling the cathode with an  
2     anode, a separator, and an electrolyte in a housing.

1           28.     A method of making an alkaline battery comprising:  
2             combining an additive, the additive including a barium salt and a coating on a surface  
3     of the barium salt, with a cathode active material including a manganese dioxide.

1           29.     The method of claim 28, wherein the coating is electrically conductive.

1           30.     The method of claim 29, wherein the coating includes a metal oxide.

1           31.     The method of claim 30, wherein the metal oxide is a tin oxide.

1           32.     The method of claim 28, wherein the barium salt includes barium sulfate,  
2     barium hydroxide, barium carbonate, or barium oxide.

1           33.     The method of claim 28, wherein the manganese dioxide is an electrolytic  
2     manganese dioxide.

1           34.     The method of claim 28, further comprising assembling the cathode with an  
2     anode, a separator, and an electrolyte in a housing.

1           35.     A method of increasing the service life of an alkaline battery comprising  
2     adding an additive, the additive including a barium salt and a coating on a surface of the  
3     barium salt, to a cathode active material including a manganese dioxide.

1           36.     The method of claim 35, wherein the coating is electrically conductive.

1           37.     The method of claim 35, wherein the coating includes a metal oxide.

1           38.     The method of claim 37, wherein the metal oxide is a tin oxide.

1           39.     The method of claim 35, wherein the barium salt includes barium sulfate,  
2     barium hydroxide, or barium oxide.

1           40.     The method of claim 35, wherein the manganese dioxide is an electrolytic  
2     manganese dioxide.

1           41.     The method of claim 35, wherein the service life of the battery in an  
2     intermittent discharge test is at least 2% longer than the service life of a battery lacking the  
3     particle.

1           42.     The method of claim 35, wherein the service life of the battery in an  
2     intermittent discharge test is at least 3% longer than the service life of a battery lacking the  
3     particle.